US Army Medical Research and Materiel

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Treatment of and/or Prophylaxis Against Brain and Spinal Cord Injury

Features and advantages:

- **DHL effectively prevented and/ or treated paralysis associated with induced ischemia in rats**
- **α-LA safely treats diabetic neuropathy in humans**
- **Prophylactic, systemic admini-stration of α-LA possible as well tolerated in humans**

This invention provides a means for treating and/or preventing neuronal damage arising from an injury to the brain or spinal cord, including that which occurs secondary to decompression sickness (DCS), by administering alpha-lipoic acid (α-LA) and/or dihydrolipoic acid (DHL). The agents can be administered before exposure to conditions which may cause damage, such as rapid changes in atmospheric pressure, or afterwards as a means of preventing or ameliorating damage arising from injuries. The agents can be administered systemically.

In humans, α-LA is used clinically to treat diabetic neuropathy. It has been shown to be neuroprotective against ischemia-reperfusion injury in both rats and gerbils. Studies have been performed in rats using DHL in combination with vehicular compounds. In one study, Dynorphin-A was used to induce ischemic spinal cord injury in rats. DHL was given as a pretreatment two hours before dynorphin-A and then was given again as a co-treatment with dynorphin-A. When the rats were evaluated 24 hours later, seven of the nine injected with DHL were normal or exhibited slight paralysis; all seven of the controls exhibited severe (1) or complete (6) flaccid paralysis.

One advantage of α-LA is that it may be administered [illegible] readily absorbed, and is rapidly converted to the more potent DHL. It is well tolerated in man and could potentially be given prophylactically to military or commercial divers at risk for decompression sickness.

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